What is claimed is:

1. A servo circuit, comprising:

a synchronous partial response maximum likelihood servo channel operable to recover servo data from servo wedges that identify respective data sectors on a data-storage disk; and

a processor coupled to and operable to control the servo channel.

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2. The servo circuit of claim 1 wherein:

the servo channel is operable to receive a servo-data sample clock; and

the servo channel comprises a digital timing-recovery loop operable to synchronize the sample clock to the servo data.

3. The servo circuit of claim 1 wherein:

the servo channel is operable to receive a servo signal that represents the servo data, the servo signal having an amplitude; and

the servo channel comprises a digital gain-recovery loop operable to adjust the gain of the servo signal to a target.

4. The servo circuit of claim 1 wherein:

the servo channel is operable to receive a servo-data sample clock; and

the servo channel comprises a circuit operable to calcuate an initial phase difference between the sample clock and the servo data.

5. The servo circuit of claim 1 wherein:

the servo channel is operable to receive a servo signal that represents the servo data, the servo signal having an amplitude; and

the servo channel comprises a circuit operable to digitally calculate an initial gain of the servo signal.

6. The servo circuit of claim 1 wherein the servo channel includes a Viterbi detector operable to recover the servo data from the servo wedges.

7. The servo circuit of claim 1 wherein the servo channel includes a decoder operable to decode the recovered servo data.

8. The servo circuit of claim 1, further comprising a demodulator for asynchronously recovering a characteristic of a position burst from the servo data.

9. The servo circuit of claim 1 wherein the processor is operable to detect one of the servo wedges during or after disk spin-up search operation without first detecting a spin-up wedge.

10. The servo circuit of claim 1, further comprising an interface circuit operable to couple the recovered servo data to and receive data from a circuit external to the servo circuit.

11. The servo circuit of claim 1 wherein the synchronous servo channel is operable to detect spin-up wedges on the data-storage disk during a spin-up search operation.

12. The servo circuit of claim 1 wherein the servo channel includes an analog-to-digital converter operable to convert an analog PR4-equalized servo signal into the digital domain.

13. A disk-drive system, comprising:

a data-storage disk having a surface, data sectors at respective locations of the surface, and servo wedges that each include respective servo data that identifies the location of a respective data sector;

a motor coupled to and operable to rotate the disk;

a read head operable to generate a read signal that represents the servo data, the read head having a position with respect to the surface of the data-storage disk;

a read-head positioning circuit operable to move the read head over the surface of the disk; and

a servo circuit coupled to the read head and to the read-head positioning system, the servo circuit including;

a synchronous servo channel operable to recover the servo data from the servo wedges; and

a processor coupled to and operable to control the servo channel.

14. A method, comprising:

reading a data-storage disk having a surface and having servo sectors disposed on the surface, the servo sectors including servo data; and

synchronously recovering the servo data from the servo sectors with a partial-response-maximum-likelihood-detection algorithm.

15. The method of claim 14, further comprising:

generating a servo signal that represents the servo data;

sampling the servo signal; and

synchronizing a sample clock to the servo data by interpolating the values of the sample clock.

16. The method of claim 14, further comprising:

generating a servo signal that represents the servo data;

sampling the servo signal; and

digitally adjusting the amplitude of the servo signal to a target level.

17. The method of claim 14, further comprising:

sampling the servo data with a sample clock;

calculating an initial phase difference between the sample clock and the servo data; and

using the initial phase difference to facilitate synchronizing the sample clock to the servo data.

18. The method of claim 14, further comprising:

generating a servo signal that represents the servo data;

calculating an initial difference between the amplitude of the servo signal and a predetermined amplitude; and

using the initial difference to facilitate adjusting the amplitude of the servo signal toward the predetermined amplitude.

19. The method of claim 14, further comprising decoding the recovered servo data.

20. The method of claim 14, further comprising asynchronously demodulation a servo-position burst from the servo data.

21. The method of claim 14, further comprising:

asynchronously detecting a servo wedge while or after the disk rotates from a first to a steady-state speed; and

reading the servo data from the detected servo wedge to determine an initial position of a read head with respect to the surface of the disk.

22. The method of claim 14, further comprising:

asynchronously detecting a servo wedge while or after the disk rotates from a first to a steady-state speed without first detecting a spin-up wedge; and

reading the servo data from the detected servo wedge to determine an initial position of a read head with respect to the surface of the disk.

23. The method of claim 14, further comprising synchronously recovering spin-up data from a spin-up wedge that is disposed on the surface of the data-storage disk.

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